DOCUMENT RESUME

ED 350 805 EC 301 619

TITLE	Model for the Identification of: Creative-Thinking Ability. Research & Demonstration Series in Gifted Education.
INSTITUTION	Ohio State Dept. of Education, Columbus. Div. of Special Education.
SPONS AGENCY	Department of Education, Washington, DC.
PUB DATE	92
NOTE	61p.; For related documents, see EC 301 617-620.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Ability Identification; *Creativity; Demonstration Programs; Elementary Secondary Education; Evaluation Methods; Gifted; Inservice Teacher Education; Models; *Program Development; Psychological Characteristics; Student Characteristics; Student Evaluation; *Talent Identification
IDENTIFIERS	Upper Arlington City Schools OH

ABSTRACT

This report describes a model demonstration project in Upper Arlington, Ohio, schools which developed a multifactored approach to the identification of creative thinking ability. The project focused on determining the characteristics and needs of creatively gifted children in a process which included research-based activities, standardized and performance-based assessment, and multiple resources and forms. This report first describes the project goals and activities, a literature review, the central questions of creativity research, and major research traditions. Then the planning process is detailed including identification of critical factors, selection of guiding parameters, and steps in designing the identification system based on a model relating four elements of creativity: person, process, product, and environment. Strategies for identifying creative thinking ability are then detailed. These include performance based assessment and behavioral observations. The final section focuses on the critical role of teacher development. It outlines steps in implementing a teacher development program, describes a sample training program, and identifies steps in problem solving. An epilogue identifies major issues noting the need to adopt one theoretical viewpoint as the underlying program rationale and the critical importance of the teaching staff's ability to recognize and teach the creative thinking process. (DB)

Model for the Identification of: Creative-Thinking Ability

Research & Demonstration Series in Gifted Education

Ohio Department of Education
Columbus, Ohio
1992

State Board of Education

President
Chester A. Roush, Kettering

Vice President
Sue Ann Norton, Westerville

Jean E. Bender, Akron
J. James Bishop, Toledo
Joseph A. Costanzo, Cleveland
John P. Dougherty, Canton
Mary Goodrich, Zanesville
Keith D. Hamilton, Painesville
Shirley Hawk, Cleveland
Jack C. Hunter, Youngstown
Virginia E. Jacobs, Lima
Mary R. Lindner, Cincinnati
William E. Moore, Woodsfield
Edwin C. Price, Jr., Cincinnati
Constance Rice, South Charleston
Anthony J. Russo, Mayfield Village
Wayne E. Shaffer, Bryan
Patricia Smith, Worthington
Sally R. Southard, Oxford
Jo A. Thatcher, Portsmouth
Martha W. Wise, Avon

Ohio Department of Education

Ted Sanders
Superintendent of Public Instruction

Irene G. Bandy-Hedden
Assistant Superintendent of Public Instruction

John Herner
Director, Division of Special Education

Joseph H. Todd
Assistant Director, Division of Special Education

Nancy Hamant
Consultant, Programs for Gifted and Talented, Division of Special Education

September 1992

CONTENTS

Cover artwork by elementary and middle school students from the Federal Hocking Local School District (clockwise from left): Adam Fowler, Daniel Wiseman, Jeremy Dotson, Richie McFee, Chris Dixon, and Heidi Rasmusson.

TED SANDERS
SUPERINTENDENT OF
PUBLIC INSTRUCTION

STATE OF OHIO
DEPARTMENT OF EDUCATION
COLUMBUS
43266-0308

September 1992

Dear Colleagues:

Although Ohio has shared in the growth of programs designed to serve gifted youngsters, a dramatic decline in academic performance over the last two decades, coupled with national concern over American productivity, has renewed interest in providing appropriate educational opportunities for all students.

In Ohio, programs have expanded from serving gifted children in 8.6 instructional units in 1975 to serving 25,974 students through 515 state-funded units and 57,146 students through locally funded programs during the 1990-91 school year. Despite this apparent growth, an additional 137,843 students identified as gifted or talented received no special services in 1990-91.

Model for the Identification of Creative-Thinking Ability is the last of four publications that comprise the research and demonstration series in gifted education. In each of these publications, school district models designed to improve the quality of education for our most-able students are described. These models, which represent our best thinking, reflect Ohio's commitment to meet the unique and individual needs of each student.

I express my sincere appreciation to the many individuals at the local school district level for their energy and dedication, and to Nancy Hamant, consultant in the Division of Special Education, and Marlene Bireley, editorial consultant, who spent many hours preparing the model descriptions for publication.

It is our hope that as educators implement the recommendations contained in the research and demonstration series, all students, including those who are gifted and talented, will benefit from improved educational opportunities and experiences.

Sincerely,

Ted Sanders

Ted Sanders
Superintendent of Public Instruction

Preface

In March 1991, *Interacting for Quality Learning: A Gifted Education Strategic Plan for the 1990's* was published under the direction of the Task Force for Effectiveness of Programs for Gifted Children. Around the time the Task Force was established, Ohio's General Assembly appropriated funds to establish research and demonstration projects for the development of model gifted education programs in the following four priority areas:

- Identifying and providing services to underachieving gifted;
- Identifying and providing services to students who are gifted in the areas of visual and performing arts;
- Providing a continuum of services to gifted students; and
- Identifying creative-thinking ability.

Thirteen districts representing rural, urban, and suburban Ohio were awarded research and demonstration grants for implementation during the 1989-90 and 1990-91 school years. Four publications comprising the research and demonstration series in gifted education have been prepared to disseminate project findings and recommendations.

Underachieving Gifted

The first, *Models for Improving the Delivery of Services to Underachieving Gifted Students,* describes three projects that focused not only on identifying types of gifted underachievers, but also on providing services through unique instructional models. In Rocky River City Schools, a "teacher as researcher" model empowered regular classroom teachers to work with underachieving gifted students. In rural Putnam County, a combination of total staff development in grades 1-8 and the adaptation of a computer-based higher-order thinking skills program was explored. And, in urban Springfield, a broad-based assessment system was used to develop an identification/intervention system.

Visual and/or Performing Arts

In *Models for Improving the Delivery of Services to Gifted Students in the Areas of Visual and Performing Arts,* strategies for identifying students, delivering hands-on arts appreciation experiences, and the development of curriculum guides are described. In Defiance City Schools, regular education teachers were prepared to increase students' access to various art media. Wheelersburg City School students were taught to use computer technology as an art medium. Lastly, in Federal Hocking Local School District (Athens County), students were made aware of the artistic components of their rural environment through art experiences, interaction with local artisans, field trips, and slide presentations.

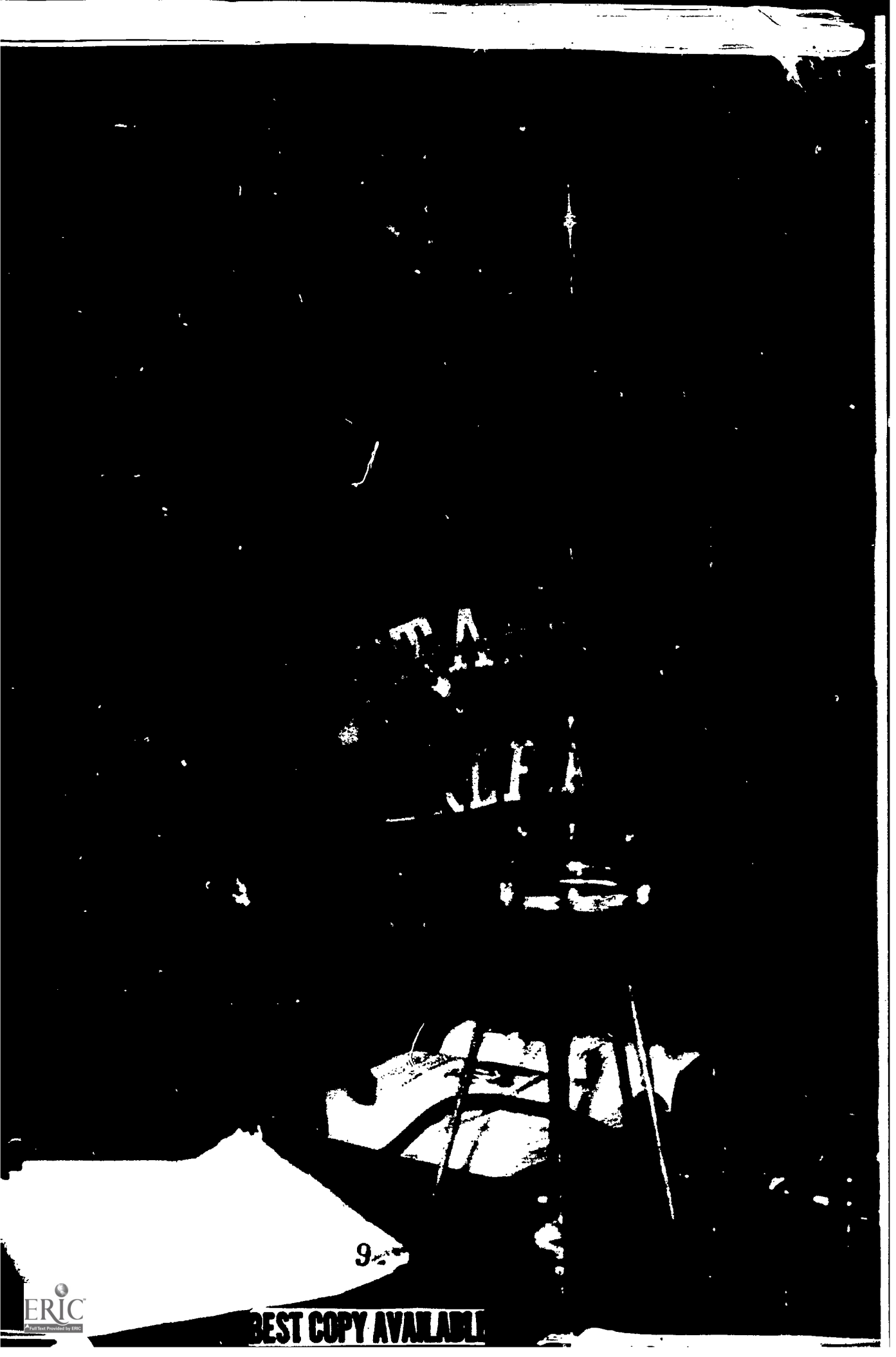
Continuum of Services

The third publication of the series, *Models for Providing a Continuum of Services to Gifted Students,* includes descriptions of six model programs that focused on the expansion of services in different contexts and grade levels. Districts awarded model projects in this priority area included Cleveland City Schools, Forest Hills Local Schools (Hamilton County), Muskingum County Schools, Reynoldsburg City Schools, Sidney City Schools, and Toledo City Schools. Various model programs, such as Major Works mentorships, Talents Unlimited, and Teacher-Leaders, are highlighted.

Creativity

The fourth and final publication in the research and demonstration series describes a *Model for the Identification of Creative-Thinking Ability.* One project was awarded in this priority area to the Upper Arlington City Schools. Project personnel believed that in order to provide appropriate educational services, the characteristics and needs of creatively gifted children should first be determined. The district's identification process, including research-based activities, standardized and performance-based assessment, and multiple resources and forms, are described in the publication.

List of Figures



Introduction

Unlike the other strands in the research and demonstration series, the project focusing on creativity was awarded to a single district and approached primarily as a research topic. Working under the direction of Dr. Margaret (Marnie) Morrison of the Upper Arlington City Schools and Dr. Rebecca Dungan of the Hilliard City Schools, a committee of gifted educators (see Appendix A) reviewed the literature and state-of-the-art practices pertaining to this topic. This publication represents their conclusions and recommendations for recognizing, rewarding, and incorporating the teaching of creativity into both the gifted and regular education curricula.

This publication is comprised of several components including a review of the literature describing concepts of creativity, the historic psychometric tradition, and the currently popular cognitive approach. Part I provides suggestions for planning a school district's identification system, including a rationale, a district definition of creativity, and an identification plan that blends the components of performance-based assessment, behavioral observations, and creativity assessment. Part II provides specific information about the three strategies for the identification of creativity: performance-based assessment, behavioral observations, and creativity assessment. Finally, Part III outlines a training component designed to enhance all teachers' ability to identify and encourage the creatively gifted child regardless of the educational setting.

In its entirety, the manual provides guidance for establishing a process that would increase the recognition of the creatively gifted child and the role of creativity in the education of all children.

The Identification of Creative-Thinking Ability: A Multifactored Approach

Identifying Information

Districts:

Upper Arlington City Schools
1950 N. Mallway Road
Upper Arlington, OH 43221
(614) 487-5000

Hilliard City Schools
5223 Cemetery Road
Hilliard, OH 43026
(614) 771-4273

Location: Central Ohio, Suburban

Population: 5,000 ADM (Upper Arlington)
7,300 ADM (Hilliard)

Project Directors: Margaret Morrison, director of gifted education services, Upper Arlington City Schools
Rebecca Dungan, coordinator, programs for the gifted, Hilliard City Schools

Project Goal and Objectives

Goal: **To develop a practical identification process for children who are gifted in creative-thinking ability that links identification criteria with current conceptualizations about the nature of the creative process**

Objective a. Review the current literature on creative thinking and the creative process

Objective b. Develop a systematic approach to the identification of creative-thinking ability based on a study of three approaches: behavioral observations, testing, and performance-based assessment

Objective c. Review and evaluate assessments, programs, and materials intended to identify and/or stimulate the development of creative-thinking and problem-solving skills

Objective d. Field test a staff development program designed to increase teacher confidence in the areas of creative thinking and problem solving

Literature Review

Since the early to mid-1980's, there have been a number of important shifts in the degree of reliance on various instruments and techniques for determining the existence of creative responses. In general, the movement has been away from emphasis on tests of divergent thinking and toward the evaluation of actual creative work. Increased attention is being

given to the relationship between creativity and problem solving; the emphasis on the domain-specific nature of creativity; and the involvement of multiple factors — cognitive, personal, motivational, and environmental — that converge in the production of creative works.

These shifts have important implications for the design of identification systems for creative-thinking ability. Rather than try to identify creative-thinking ability as an isolated and specific cognitive trait, it now seems more appropriate to evaluate creative products or performance. At the same time, it seems appropriate to modify, but not eliminate, the use of tests that purport to measure creative-thinking ability. Rather than being used as a method of identification, creativity tests might be more appropriately used as a method of screening students for creative potential. With support and encouragement, students with creative potential may become creative *producers*.

The Central Questions of Creativity Research

Throughout history there have been attempts to explain how the uniquely original ideas and works that we recognize as *creative* come into existence. Some believed creativity to be a mysterious phenomenon possessed by the very few and to be beyond the capabilities of mere mortals. Others asked producers of such works to describe their thoughts and feelings, attempting to apply these reports to their own experiences. Finally, at the mid-point of this century, psychologists began to explore the creative process in earnest, stimulated by J.P. Guilford's (1950) proposal that intelligence was comprised of multiple factors, among them problem solving and divergent (creative) abilities. As Sternberg (1988) points out, vigorous creativity research programs continued through the 1960's and 1970's and, following a lull in the late 1970's, have been vigorously pursued up to the present time.

The Nature of Creativity. The central questions posed by psychologists studying this phenomenon revolve around the nature of creativity. Is creativity something that represents the end-state of cognitive or personal development? If so, can everyone, theoretically, attain this end-state? Does creativity represent a different kind of thinking or being? Are some people born with this quality or do they somehow develop more of this ability than others? Can creativity be defined as problem solving or vice versa? Is creativity really a behavior that results from a special type of interaction among intellectual, stylistic, personality, and environmental factors?

Major Research Traditions

Two major research traditions in psychology have provided findings that are most immediately germane to the school-based identification of creativity in children: the psychometric tradition and the cognitive orientation. The former has attempted to determine which cognitive factors comprise or contribute to creativity and creative thinking. To do this, researchers have developed a wide variety of divergent thinking tests that yield scores for factors such as fluency of ideas, flexibility, originality, and elaborations. Cognitive psychologists have approached the study of creativity from information processing, developmental, and systems orientations. These psychologists have investigated the cognitive functions that may contribute to creative *thinking*, explored the relationship of creativity to problem solving and metaphorical thought, and charted the potential interactions among cognitive, motivational, and environmental factors that contribute to creative performance.

The Psychometric Tradition. Representative of the psychometric tradition is the work of J.P. Guilford and his colleagues. Guilford (1950, 1956, 1959) identified 120 facets of intelligence, including several divergent abilities. Guilford specifically defined creativity as a problem-solving process. Tests were devised to study several of these abilities, many of them by Meeker and Meeker (1985).

E. Paul Torrance, who created what have become the most popularly used tests of creative-thinking ability, pointed out that "scientists studying creative behavior and its predictability characteristically have been unrealistic in their expectations of the predictability of tests of creative thinking" (1977, p. 11). Torrance (1988) recently reported positive longitudinal relationships between test results and creative productivity when his battery of tests, the *Torrance Tests of Creative Thinking* (1966, 1974) were used, but some of his analyses of earlier data have been questioned (Kogan, 1983).

Mednick (1962) and his colleagues devised the *Remote Associates Test* (Mednick & Mednick, 1967) and conducted research using this instrument that requires finding a word that associates with a series of three words in a specific way (e.g., rat, blue, cottage=cheese). They believe that the more remote the elements, the more creative the solution.

Brown (1989) and others have faulted all of the psychometric approaches in that, while they were responsive to theoretical ideas, they were not sufficiently validated against any external measure of creative productivity. While they seem to tap the ability of ideational fluency, the relationship between divergent thinking and "real life" creative productivity is not yet clear. Longitudinal research programs would provide the most compelling evidence, but such studies are few and far between (see Clark, Griffing, & Johnson, 1989; Harrington, Block, & Block, 1983). Brown (1989) concludes that we cannot yet say whether fluency tests tap creativity or some other construct; how informational content, emotional, and motivational factors influence performance on creativity (or fluency) tests; and whether creativity is a general or domain-specific trait. He believes that studying the generation of remote associations, creativity as general problem-solving ability, the role of personality and motivation, and person-situational interactions are fruitful research endeavors.

Creativity and Problem Solving. The point at which creativity research and educational practice intersect most vividly is in the area of creative problem solving. Many scholars have drawn attention to the critical importance of problem solving and other thinking skills in the curriculum (Brandt, 1988; Costa, 1985; Marzano, Brandt, Hughes, Jones, Presseisen, Ranking, & Suhor, 1988). Efforts are being made by educators to help students develop problem-finding and problem-solving skills, both in relation to specific disciplines and through the use of heuristics, or sets of rules, that might guide problem solving across all disciplines and in "real life" situations (Treffinger, 1989).

The Relationship Between Creativity and Problem Solving. Guilford and Torrance both linked creativity to problem solving and both recognized that problem solving requires a number of skills or cognitive processes (Guilford & Hoepfer, 1971; Torrance, 1979). Guilford's work, in particular, provided a base for many authors who developed programs to teach problem-solving strategies and skills. Among the most widely known are Osborn, Parnes, Feldhusen, and Treffinger. Osborn (1963) first introduced

the concept of brainstorming and Parnes (1967) developed the systematic approach to creative problem solving that has served as the primary research in the field for a number of years. Feldhusen and Treffinger have collaborated on three editions of the widely-used *Creative Thinking and Problem Solving in Gifted Education* (1985) and Treffinger has coauthored an extensive resource guide that is used for training teachers and other instructional leaders in the creative problem-solving process (Isaksen, Scott, & Treffinger, 1985).

Torrance's studies of creative thinking, coupled with his observations of the climate of education and world events, led him to become increasingly concerned about what he saw as the decline of creativity in the United States and the lack of knowledge of, and concern about, the future by the country's young people. When an opportunity presented itself, Torrance decide to combine the creative problem-solving process with problems related to the future and created the Future Problem-Solving (FPS) program. FPS is now a nationally recognized competitive program that encourages young people to develop unique, original solutions to pressing world problems.

Weisberg, a cognitive psychologist, is a proponent of an incremental rather than a "genius" view of creative problem solving. He believes that creativity is an activity resulting from the "ordinary thought processes of ordinary individuals" (1988, p. 148). The *creativity* results from the fact that the individual provides a novel solution for solving a given problem. He views each new product as a modification and elaboration of earlier work and that "true originality evolves as the individual goes beyond what others have done before" (1988, p. 173).

D. N. Perkins (1984) views creative people as those who strive for originality, are capable of redefining or transforming problems if necessary, work more at the edge than at the center of their competence, seek intelligent criticism, subject their ideas to appropriate tests, and feel that they choose what to do and how to do it. He believes that a strong knowledge base in a particular field and an excitement about creative inquiry are prerequisites to success.

All of these theorists have addressed the relationship of creative thinking, problem finding, and problem solving. While the cognitive researchers tend to view the testing of divergent thinking skills as the trivialization of a very complex process (Piirto, 1992), the problem-solving researchers pay homage to the ultimate complexity of the creativity construct. Their task, as they see it, is to attempt to define the cognitive factors that contribute to, and provide the basis for, creativity.

Multifactored/Cognitive Approaches. The multifactored orientation to creativity encompasses or represents cognitive developmental information-processing and systems approaches. In general, these researchers refer in their theories to various components of intellectual functioning and the relationship of those components to each other and to creative production, while recognizing the critical role of environmental factors in creative production. Three scholars who have offered a multifactored view of creativity have provided insights that are relevant to the design of a systematic approach to the identification of creative-thinking ability.

Componential/Social Psychological Model. Teresa Amabile (1983) outlined a componential/social psychological model of creativity that includes three key elements: (a) domain-relevant skills, including knowledge about the domain, technical skills, and special domain-related talent; (b) creativity-relevant skills, including cognitive and personality characteristics; and, (c) task motivation. A few of the skills that are needed (as summarized by Brown, 1989) include the cognitive style skills of perceptual or conceptual set breaking, suspending judgment, and delaying closure; the use of heuristics for generating novel responses; and such conducive workstyles as the ability to concentrate for long periods of time, willingness to abandon fruitless searches, self-discipline, perseverance, and the ability to delay gratification.

Interacting Systems Perspective. Gardner (1988) views the creativity question from an interacting systems perspective. These systems include the genetic/biological, the psychological, the knowledge domain, and the social context. His seven competencies or intelligences — linguistic, musical, logical-mathematical, spatial, psychomotor, intrapersonal, and interpersonal — are viewed as discrete entities that are used to solve problems or create products that are valued within one or more cultural settings. From a field-specific approach, Gardner believes that we should not refer to individuals as *creative* but instead refer to them as creative artists or creative scientists, for example.

The Investment Metaphor. Sternberg (1991) suggests that creativity involves the definition and redefinition of problems and that a number of variables interact in the production of creative works. He has proposed the investment metaphor as a theory of creativity. He believes that creativity stems from an interaction of the six resources of intellectual processes, knowledge, intellectual style, personality, motivation, and environment. As the interaction of these resources changes over the lifespan of an individual, so may that individual's level of creativity change. As the six resources converge and generate various domain-specific abilities, they will yield products that can be evaluated. It is his belief that we can measure creativity only through evaluation of products (1991, p. 5).

Researchers who have offered systems views of creativity have made three important contributions to our perspective on the identification of creative-thinking ability: (a) the view that creativity does not stem from a single trait or ability, but results from interaction of personal characteristics, cognitive abilities, and social environments; (b) the focus on knowledge within a domain as an important basis for creative production; and (c) the need to measure creativity or creative thinking through the evaluation of creative products.

Summary of the Research Literature

Creativity and creative thinking are conceptualized in different ways by scholars and practitioners in different disciplines, resulting in a range of definitions from those that are fairly narrow to those that describe interactions of multiple factors that contribute to creative performance. Researchers have also identified a number of cognitive and personality characteristics that appear to describe individuals who have made substantial creative contributions across a number of different domains.

Based on findings reported in the research literature, there seem to be three basic approaches to the identification of creative-thinking ability: (a) testing of discrete cognitive abilities that might be implicated in the creative-thinking process; (b) evaluation of creative products, performances, ideas, and solutions to problems with the assumption that, if the product is judged to be creative, a complex of processes (both cognitive and motivational) have worked together efficiently to produce it; and, (c) observation of creative behaviors that are thought to be related to creative performance in adulthood. Of these, the current weight of opinion in the field seems to support the evaluation of creative products as the most defensible method by which to identify creative talent. Testing may suggest creative potential, while possession of certain personality and motivational traits may suggest a predisposition that will encourage creative performance.

The general tenor of the current education reform movement suggests that in the future there will be an increasingly strong focus in the schools on the development of critical- and creative-thinking skills and problem-solving ability by all children, within and across discipline areas, and an evaluation of actual performance and achievement through the curriculum as an adjunct to the use of standardized tests. In order to be credible and defensible within the context of the times, this project's approach to the identification of children with unique ability in creative thinking will need to be responsive to both these movements and the current body of research findings and theoretical orientations in the field.

Part I: Planning a School District Identification System

Critical Factors

Such factors as the 1984 Ohio *Rule for School Foundation Units For Gifted Children* (3301-51-15) that provides guidelines for the identification of children in four areas, including creative-thinking ability; the 1987 Ohio legislative mandate to identify children, grades 1-12, who have unique abilities in the areas listed in the *Rule*; and, the current requirement that school systems must report annually to the state the number of identified children and the services provided for them must be considered in the development of an identification system.

Other factors must also be considered, such as the lack of state funding for the mandated identification process, the limited state funding of existing gifted programs, and the variance in philosophical and administrative support for the identification of and programming for gifted children.

A practical concern in the area of creative-thinking ability is the belief that funds now being used to identify students as gifted in this area might better be used to encourage the development of creative-thinking and problem-solving skills in all children. Certainly, children exist who have unique ideas and who are original problem solvers. Even the most capable and dedicated teachers run out of time and resources to provide appropriate challenges, and problems exist in identifying them through traditional standardized tests and classroom activities.

School personnel must find a way, within the constraints of their school situation, to locate students with unique ability in creative thinking in accordance with guidelines provided by the state *Rule*. Their success will depend, in part, upon district resources available; the level of administrative interest, concern, and support; and, the degree of teacher responsiveness.

Guiding Parameters

Criteria were established to guide the development of the identification system outlined in this publication. The system was designed to be

- **DEFENSIBLE** ... to be based on what we know about creative thinking and its development, and the ability to nurture it in childhood
- **MULTIFACTORED** ... to encompass all of the components of creative thinking
- **FLEXIBLE** ... to allow each school district to develop an identification process that responds appropriately to the specific nature of its students and teachers, and to community expectations
- **REASONABLE** ... to encourage school districts and teachers to chart a course that responds to the realities of teacher awareness and preparation, administrator awareness and support, and the availability of necessary resources

Propositions

The following propositions, or statements of philosophy, were also devised to guide the development of the system and its components:

1. The system should rest on (a) an operational definition of creative thinking that is compatible with the existing state *Rule;* and, (b) a clearly stated explanation regarding why these children should be identified.
2. The system should include components that represent each of the potential methods for identifying creative-thinking ability, namely, performance-based assessment, behavioral observation, and testing.
3. The extent to which each component is used for identification should be allowed to vary in relationship to staff members' understanding about creative thinking, and their skill in recognizing and facilitating the creative response.

Steps in Designing an Identification System

Three steps are involved in developing a school district identification system. **Step One** involves establishing a rationale for identification. In **Step Two,** an operational definition of creativity is selected and, in **Step Three**, a district plan is created to guide identification efforts. These three fundamental steps, critical in the development of a defensible and workable system, should involve representative administrators, teachers, and parents in the initial planning stage.

School districts vary, not only in terms of tangible characteristics like their funding base and personnel, but also in less tangible, but important characteristics, such as their responsiveness to change and their readiness to provide the time, energy, and finances needed to offer staff development for creativity, creative thinking, and creative problem solving in the classroom.

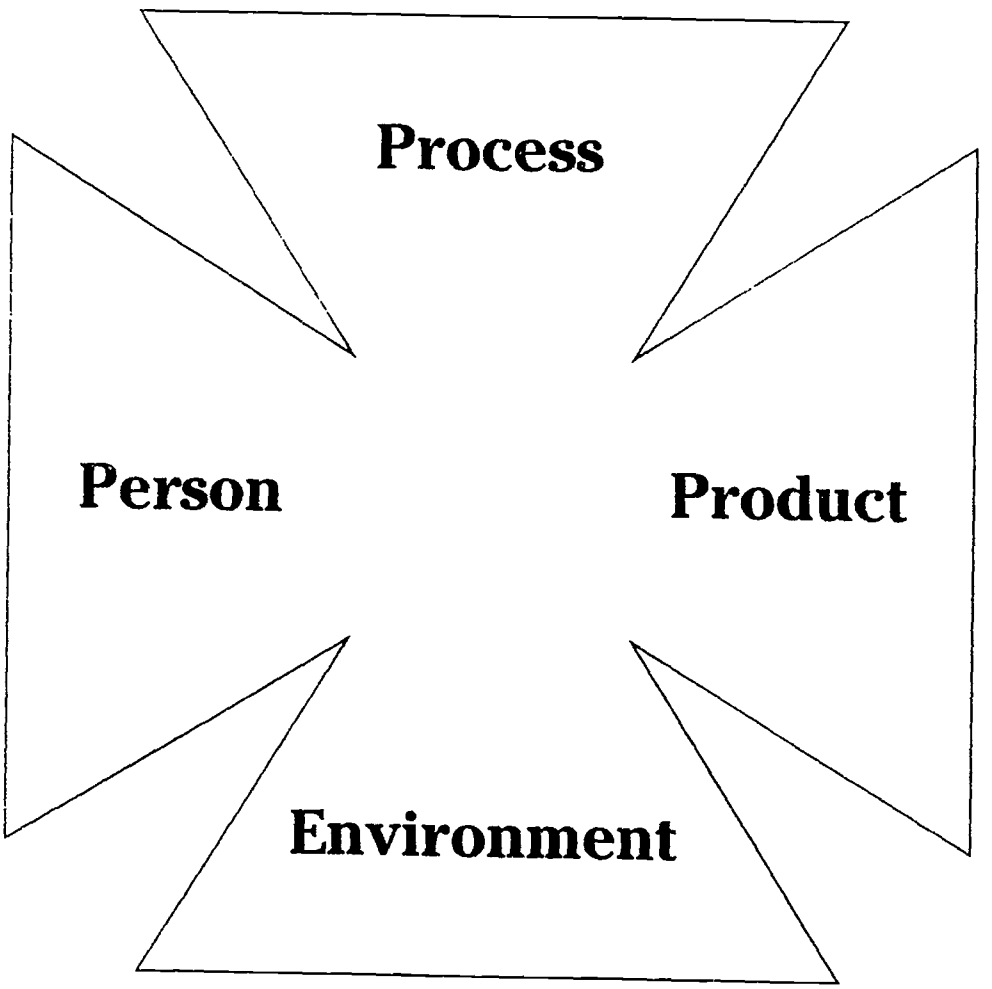
Establishing a Rationale for Identification. It is important to identify, support, and encourage not only those children who are using their abilities to become creatively *productive*, but also those children who are not using their abilities in productive ways. Different identification techniques and services may be required to address the special needs of children in each group.

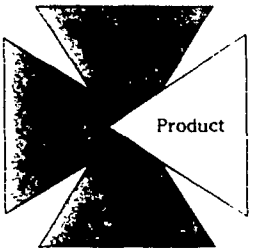
Selecting an Operational Definition of Creativity. Four elements are associated with the terms *creativity* and *creative thinking*: person, process, products, and environment (MacKinnon, 1970). These interrelated elements (see Figure 1) form the basis for a systematic approach to the identification of unique ability in creative thinking.

An operational definition of creativity, recommended for use in the identification of creative-thinking ability because it encompasses the elements of *person*, *product*, and *process*, follows:

> *Creativity is the setting and solving of meaningful problems using an inner drive to recombine our storehouse of experiences in a new way* (Parnes, S.J., 1972).

Figure 1
Components of an Identification System

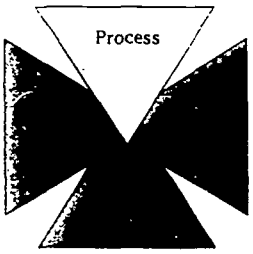




Product. Products can be described as solutions to meaningful problems, questions, and issues. For example, the question or problem may involve the expression of ideas or feelings, the best way to motivate others to act, or strategies for saving an animal from extinction. The solutions may be new to the person and/or new to society (see Figure 2).

Process. Process can be characterized as recombining our storehouses of experiences in a new way. In other words, facts, ideas, and experiences may be recombined, elements may be linked in new ways, and metaphors and analogies may be used to gain new perspectives.

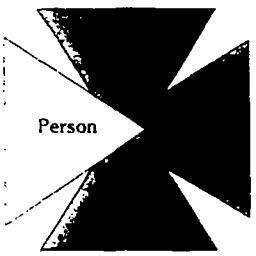
Following are several "cases in point" that illustrate the *process* of recombining experiences in new or different ways:



- Galileo had the same information many other astronomers of his day possessed; he combined the specifics in new way.
- Napoleon was familiar with the commonly accepted practices of military engagement; he combined them in new ways.
- Guttenberg combined the functions of the wine press and the coin punch to create the modern printing press.
- Bushnell, who started the video game revolution, combined television with games so that we could interact with this previously one-way medium.

Those who recombine information do not necessarily have more information than others. However, the more that is known, the more that is available to recombine or manipulate. Process skills can be developed and enhanced by

1. Gaining knowledge about and having practice in using thinking skills and strategies, such as steps in creative problem solving; strategies for increasing fluency, flexibility, and originality of idea; and, metaphorical thinking.
2. Building our storehouse of knowledge and experiences.



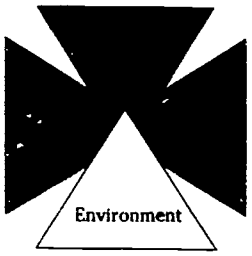
Person. *Personal traits*, such as the recognition of and heightened sensitivity to problems and opportunities, are important components of creativity. Equally important is *personal motivation.* This quality, sometimes described as inner drive, can be seen in intense desire; precise and prolonged grappling with an issue; arduous, unceasing dedication; and, the willingness to take risks.

Personal traits can be enhanced by activities that open the mind, such as observation and visualization, and activities that stretch the mind (Raudsepp, 1980; Von Oech, 1983).

Figure 2
Types of Products

New to the Person *Consistent patterns of innovative thought, problem seeking, and problem solving*		**New to Society** *That which moves the discipline forward*
Generating an idea about how something works by linking several facts and concepts	THEORIES	relativity gravity personality evolution psycholinguistics
Using materials in unique or original ways to express ideas	TECHNIQUES	expressionism cubism modern dance
Constructing mechanisms that are new to the child by linking objects or materials in new ways	INVENTIONS	light bulb telephone airplane
Sharing original insights and ideas through plays, poems, video productions, reports, pieces of music	COMPOSITIONS	Moby Dick King Lear "Star Wars" "All in the Family"

22



Environment. The environment can be modified to enhance creativity by

- Providing direct instruction in the "tools" of thinking
- Extending and using the tools of thinking through such activities as simulations, think tanks, practice activities, Future Problem Solving, or commercial materials
- Tackling real problems that affect individuals, groups, classrooms, your community, and our world
- Working in or providing an atmosphere in which creative thought is encouraged and facilitated (from Clark, 1986)
- Creating situations that present incompleteness and openness
- Emphasizing self-initiated exploring, observing, questioning, feeling, classifying, inferring, translating, and communicating
- Providing an atmosphere of acceptance where self-expression is encouraged
- Allowing disagreement and controversy without hostility
- Valuing originality

Designing a District Plan to Guide Identification Efforts. Three methods, used widely in the study of creative thinking in childhood, provide the foundation for guiding school district identification efforts. These methods involve the

1. Evaluation of products or performances for evidence of originality;
2. Analysis of specific responses to determine if they represent cognitive **processes** implicated in creative thinking, such as ideational fluency and originality; and
3. Examination of **personal** traits and motivations to determine whether they are similar to characteristics possessed by creatively-productive adults.

Any of these avenues, singly or in combination, may alert us to the potential of unique ability. Therefore, a defensible identification system will include opportunities for children to be screened, though not necessarily identified as gifted, through each of these methods. Some methods will help locate children who are creatively productive, while other methods may help locate children with potentially unique ability who are not able to, or who do not choose to, use their ability productively. Limiting the screening process to only one or two avenues may lead to inadequate or incomplete identification of children with unique potential and ability in creative thinking.

Strategies recommended for use by school districts in screening and/or identifying students with unique ability in creative thinking are described briefly below. A detailed explanation of each strategy or component is provided in Part II of this publication.

- **Performance-based Assessment**
  Screening and identifying by evaluating products, performances, solutions, or ideas for evidence of originality
- **Creative-thinking Assessment**
  Screening, not identifying, by evaluating responses that may represent cognitive abilities implicated in creative thinking, such as fluency of ideas, flexibility of thought, or originality
- **Behavioral Observations**
  Screening and adding to identification information by looking for patterns of behavior that suggest personal traits and motivations similar to those of creatively productive adults

The extent to which each of the three strategies described above is used should vary according to the level of teacher training in, and knowledge about, creative thinking and problem solving. Ideally, with extensive training and teacher preparation, the greatest reliance will be placed on performance-based assessment and behavioral observations, with testing used only minimally. However, until teachers have the requisite experience and knowledge base to know (a) what capabilities they are looking for, and (b) how to provide opportunities for all students to demonstrate those abilities in the classroom, assessment strategies should be used more extensively to insure that all students have equal opportunity to demonstrate creative-thinking abilities.

As school districts begin to design an identification program, an assessment should be made of the degree to which teachers have acquired both knowledge of, and experience in, applying creative-thinking and problem-solving processes in the classroom. It may be wise to include all teachers in initial training efforts. If some teachers have received training, a second opportunity might be used to reinforce existing knowledge and skills, while providing others with new information and skills. The critical role of personnel preparation in identifying students with creative-thinking ability is discussed in Part III of this publication.

Part II: Strategies for Identifying Creative-Thinking Ability

Performance-based assessment, behavioral observations, and creative-thinking assessment are strategies for identifying unique ability in creative thinking and, together, provide the basis for a multifactored identification system (see Figure 3).

Performance-based Assessment

Performance-based assessment is valuable and appropriate to the identification of unique ability in creative thinking because it is assumed that the production of highly creative products, ideas, or solutions results at least in part from a creative-thinking process. Performance-based assessment involves the use of judges with expertise in relevant fields to (a) examine student products and evaluate the extent to which each product is creative, and/or to (b) determine the extent to which a body of student work represents unique ability in creative thinking.

Performance-based assessment can be used at all grade levels, in multiple discipline areas, and as part of special programs and competitions. It can also be used to judge student responses to problems encountered in daily life. Because the generation of creative ideas and products represents a confluence of personal, process, and environmental factors, performance-based assessment seems to reflect the "real world" of creativity better than other assessment methods, and it more closely parallels the nature of adult creative work.

Judging the Creativity of Products and Student Performance. Individual teachers, mentors, and coaches can look for evidence of creativity in products, performances, and solutions to problems (see Figure 4). These people are also in an excellent position to observe how the product development process unfolds, and to evaluate (a) problem-finding abilities, such as identifying a unique problem or taking an unusual approach to a problem; (b) personal factors, such as intellectual risk-taking and commitment to the project; and (c) the use of specific cognitive processes that result in generation of a large number of ideas or potential solutions, or the use of metaphorical thought or analogies to solve a problem. Teachers, mentors, and coaches can record their observations of problem finding, personal factors, and cognitive processes on behavioral observation forms or checklists such as those shown in Figures 7 and 8.

The Consensual Assessment Technique. For increased validity, and particularly for use in an identification process, it is best to have more than one evaluator make judgments about creativity, whether the judgments concern (a) the extent to which a single product, performance, or solution is "creative," or (b) the extent to which a body of work may represent unique ability in creative thinking. A consensual assessment process is the mechanism recommended for making these types of judgments. This is a method whereby more than one person with expertise in the specific field(s) involved (a) examines products from several students and judges the relative creativity of those products, and/or (b) examines a portfolio of student work to determine if the collection of work represents unique ability in creative thinking.

Figure 3
Strategies for the Identification of Creative-Thinking Ability

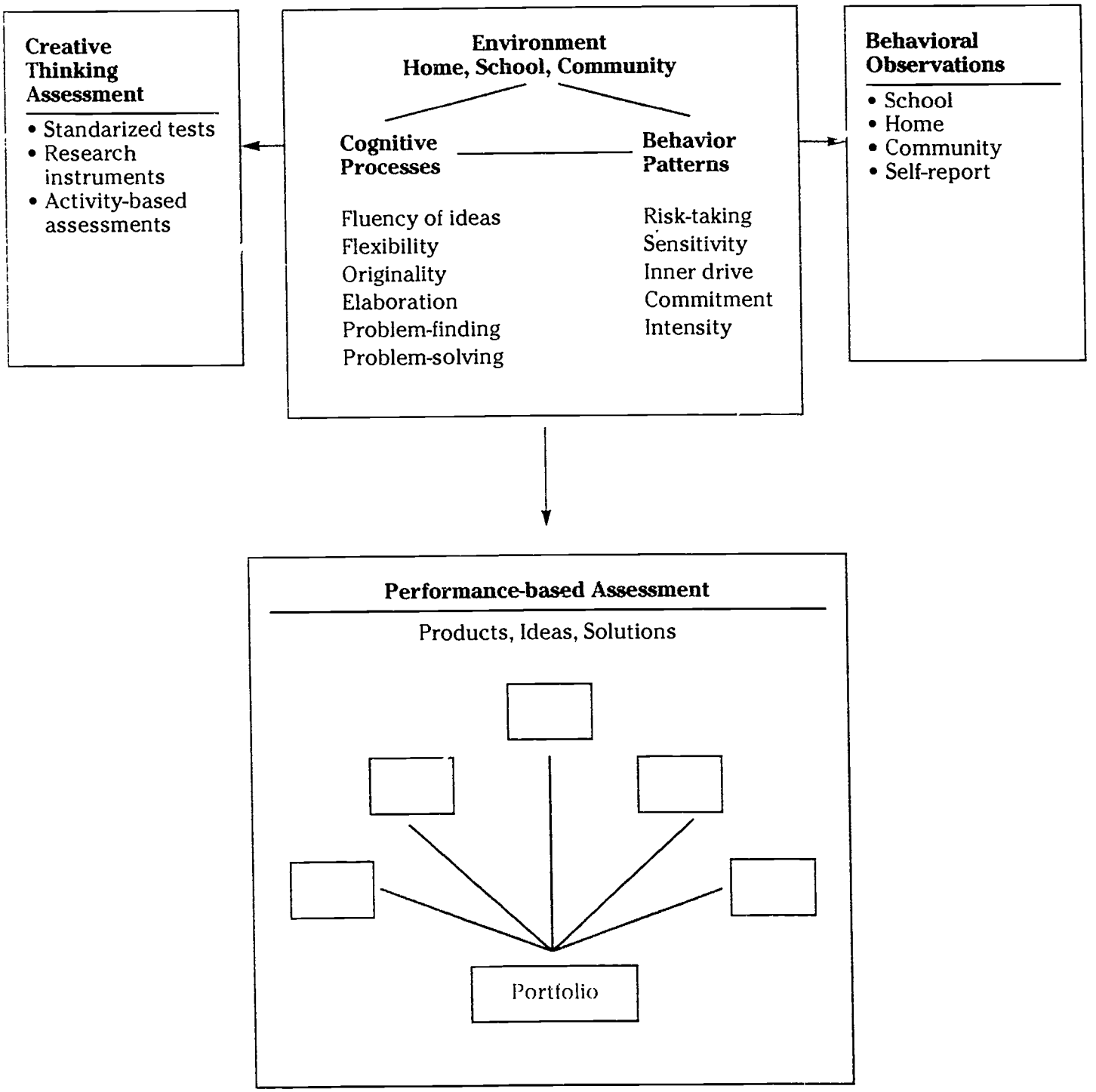


Figure 4
Opportunities for Performance-based Assessment of Creative Thinking and Problem Solving

Social, Personal, Community Problems	Social Studies	Science Technology	Math	Literature and Arts	Themes
School-based Think Tanks	Future Studies	Inventions	Manipulatives	Odyssey of the Mind	Odyssey of the Mind
Student Council	Future Problem Solving	Future Studies		Music, Art Dance Drama Contests	Future Problem Solving
Classroom Problem Solving		Future Problem Solving			
School Problem Solving	History Day			Research Papers	
	Science Fairs			Play Writing	
Community Problem Solving	Odyssey of the Mind			Holistic Writing Assessment	
After-school Problem Solving Groups				Power of the Pen	

Whether or not a product is *creative* depends, in part, on the definition of what constitutes a creative product. Hennessey and Amabile (1988) suggest that a product be viewed as creative to the extent that it is both a novel response and an appropriate, useful, correct, or valuable response to an open-ended task.

Recommendations for Consensual Agreement. The following recommendations were offered to researchers by Hennessey and Amabile (1988) for use in studies related to creativity:

1. **Use experienced knowledgeable judges**
   The judges should all have experience with the domain in question although the level of experience for all judges need not be identical. Judges need to be familiar enough with the domain to have developed over time some implicit criteria for creativity, technical goodness, and so on.

2. **Make assessments independently**
   Judges should make their assessments independently. They should not be trained to agree with one another, should not be given specific criteria for assessing creativity, and should not have the opportunity to confer while making their assessments.

3. **Make judgments on other dimensions at the same time**
   Judges should make assessments on other dimensions in addition to creativity, such as the technical aspects of the products in question or their aesthetic appeal. This will make it possible to determine whether their judgments of creativity are related to, or independent of, those dimensions.

4. **Rate products relative to each other**
   Judges should be instructed to rate the products relative to one another, rather than against some absolute standard they might hold for work in their domain.

5. **Rate products in random order**
   Each judge should view the products in a different random order, and should consider the various dimensions of judgment in a different random order. Otherwise, if all judgments were made in the same order by all judges, a high degree of agreement among the judges might reflect the method of judgment, rather than the degree of originality observed (p. 15-16).

Using Performance-based Assessment for Identification

Students could be screened, referred, and identified using a system of performance-based assessment as illustrated in Figures 5 and 6. Teachers trained in creative thinking strategies may conduct classroom activities, use activity-based assessments, use standardized instruments, or review student work as a basis for referring students for further consideration within the identification process. Although teachers not yet trained would rely more on activity-based assessment and standardized instruments than on classroom activities, they would also examine student work as a means of screening their students.

The referral person would include a listing of specific behavior characteristics and ratings of student work. The referral may also include results of any assessment completed with the student. In addition, the referral would include intelligence test scores, as required by the Ohio *Rule*. Identification would be determined through a consensus-building process.

Identifying Consistent Patterns of Behavior. Performance-based assessment can occur at all grade levels, in multiple discipline areas, through special programs and competitions (see Appendix B), and by examining "real life" products, performances, and solutions to problems. To support an identification of unique ability in creative thinking, student performance should be viewed across time until a consistent pattern of behavior emerges. Consistency should be observed both in the types of responses the student gives and the types of behavioral characteristics that are demonstrated.

Creativity portfolios may be useful for compiling samples of student work across time that have been, or could be, evaluated for evidence of originality. Portfolios might be kept for all students or might be started when a child first demonstrates potentially unique performance. Student work might include

- Samples of creative writing
- Samples or photographs of artwork
- Copies of musical compositions
- Descriptions and pictures of inventions
- Originality ratings from special contests or programs, such as Future Problem Solving or Odyssey of the Mind
- Descriptions and pictures of Science Fair or History Day projects and their ratings
- Descriptions of "real life" problems that were solved creatively, perhaps through a "think tank" process in the classroom, or a student council project

In some classrooms, teachers use student portfolios to collect examples of writing and other work completed during the school year or over several years as a means of demonstrating student progress. For use in gifted student identification, it is recommended that a separate creativity portfolio be used, drawing copies of materials from the classroom portfolio as appropriate.

Figure 5

Performance-based Assessment for Gifted Identification

Creative Thinking

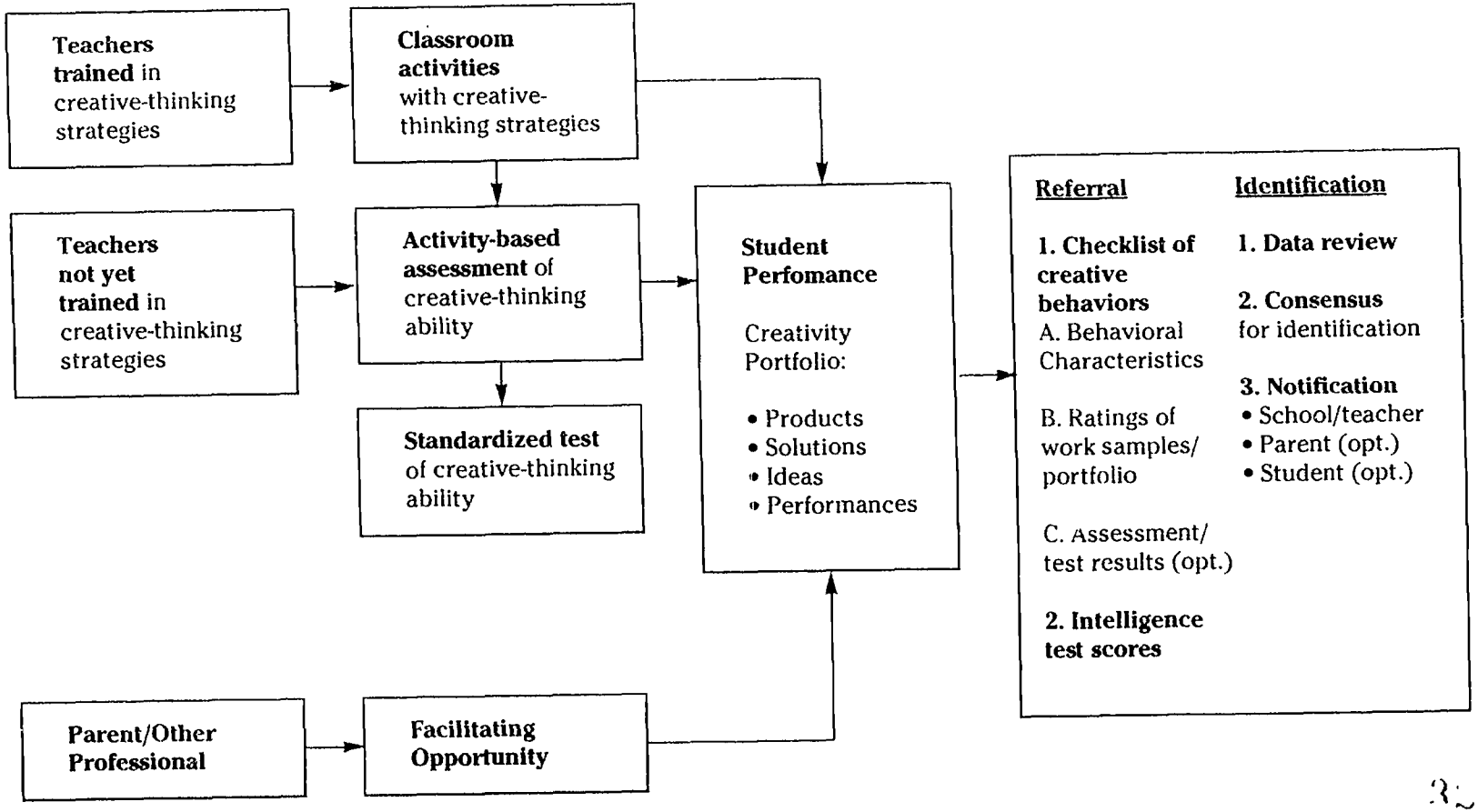


Figure 6
Multifactored Identification of Unique Ability in Creative Thinking

Classroom Activities That Elicit Creative Responses

- Opportunities for creative problem solving, inventing
- Discipline-based research; independent projects; writing
- Holistic writing assessment
- Special programs: Science Fair, History Day, OM, FPS
- Literary, dramatic arts
- Activity-based assessment: fluency, flexibility, originality

Home/Community Activities That Elicit Creative Responses

- Opportunities for creative problem solving, inventing
- Independent research and projects; creative writing
- Special programs; competitions
- Interest-based activities and lessons in the sciences and arts
- Play experiences; creating a production; conducting experiments; making a video/movie

Creativity Testing

- Screen at least once to find high potential/ nonproductive students
- Individual testing to help resolve issues, questions

Referral

- Checklist(s) of behaviors and ratings of creative work
- Attach
  (a) Three work samples or portfolio of creative work
  (b) Intelligence test scores
  (c) Optional: activity-based assessment results

Data Review and Identification

- Prefer group consensus
- Review checklists, teacher ratings of creative work and work samples for evidence of unique ability at this age; solicit input from experts as appropriate
- Check intelligence/aptitude scores
- Identify in accordance with Ohio *Rule* (3301-51-15)

Notification of Identification

- School
- Parents (opt.)
- Student (opt.)

Student Planning
Matching student abilities and needs with available resources

Figure 7
Teacher Rating of Creative Work

Work Sample or Student Portfolio

Please attach this rating form to the work sample or student portfolio.

Student name _____ School year _____ Grade _____

Teacher _____

1. What was the problem/assignment/discipline area?
2. Time span of activity: From _____ to _____
3. Briefly describe the *planned* outcome/product/solution:

4. Not all plans result in satisfactory outcomes, although the work completed during the project may have been approached in a very original way. Was this outcome successful? _____ yes _____ no
   If not, please explain (use back if necessary).

	Teacher Rating		
In comparison with other students with whom I have worked, this product/idea/solution shows evidence of:	**5 Exemplary**	**4 Excellent**	**3 Adequate**
1. Unique point of view; novel or original solution; unusual perspective.	startling	unusual	adequate
2. Valuable and appropriate contribution for this age.	very valuable, appropriate	valuable, appropriate	adequate
3. Inner drive; sustained effort to completion.	overcame many obstacles	stuck with it over time	adequate time spent
4. Increase in, and application of, knowledge as a basis for creating unique solutions.	read, learned in tangential fields	read widely	read adequately
5. Choice of topic/problem that reflects potential for failure; working on the edge of competence; personal risk-taking.	took great amount of risk in choice of topic	moderate risk	some risk

Figure 8
Sample Observation Form

BEHAVIORAL CHARACTERISTICS
RELATED TO
CREATIVE THINKING

Student _____ Date _____

Age _____ Grade _____ School _____

Person completing _____

Relationship to child _____ Phone _____

Characteristic	Observed Consistently	Now and then	Not yet
In relationship to other children this age			
1. Has wide range of interests across many subject areas and topics, including some that are stereotypically held by opposite sex.			
2. Uninterested in facts and details.			
3. Discovers or notices important problems; finds problems to solve.			
4. Is open to new and varied experiences in many areas, such as fantasy, feelings, ideas, aesthetics, values, actions.			
5. Takes intellectual risks: choice of topics/problems reflects potential for failure; enjoys working on the edge of competence.			
6. Uninhibited in behavior; spontaneous.			
7. Categorizes ideas differently; more broadly; can see more linkages between ideas and things than other students.			
8. Is confident of abilities and ideas; may even seem overly confident.			
9. Becomes intensely involved in creative/problem-solving activity.			
10. Enjoys complexity, ambiguity in ideas and situations.			

Each entry in the creativity portfolio should include a creativity rating completed by the teacher and/or other professionals. Use of a similar format for each entry, either to record the initial rating or to summarize ratings provided in a different format will assist those who will review and evaluate the entries. The same or a similar form might also be used to summarize or tally all of the ratings in a creativity portfolio. A sample form is provided in Figure 7.

When the body of evidence in the portfolio is sufficient to support an identification of unique ability in creative thinking, the portfolio should be forwarded with other documentation for review by those who will be making the formal identification decision. Procedurally, the other materials required by Ohio law (a teacher checklist of creative behavior and a copy of intelligence test scores) might be clipped to the front of the portfolio, with a referral form or other cover sheet.

Behavioral Observations

Behavioral observations are typically focused on discrete behaviors, such as fluency of ideas or risk-taking, that occur within a limited time frame in relationship to a specific problem but that may occur over and over as the child continues to find and solve meaningful problems. Indeed, one type of behavior related to creative thinking may be observed fairly consistently while evidence of other creative behaviors may be relatively scarce.

For example, a child may consistently find meaningful problems and be enthusiastic about addressing them but may not be able to move beyond that step to actually solve the problems. Or, a student may have lots of very unique ideas, but not be able to use or apply them in meaningful ways. In terms of traits and motivation, a child may be very individualistic or have strong risk-taking skills but may not be able to apply those characteristics to the production of creative solutions. Thus, by observing a child as he/she attempts to produce creative solutions, it is possible to identify the specific type of assistance that the child may need in order to become a consistently creative producer.

The observations that are possible in a performance-based, problem-solving setting go beyond discrete behaviors and relate to the entire process involved in solving long-term problems of substance and complexity (see Figure 8). The question is, does this child have the combination of characteristics that allows him/her to solve meaningful problems in creative ways? Only by observing the journey and evaluating the outcome can we answer that type of question. Guidelines for observing behavior are provided in Figure 9.

Assessing Creative-Thinking Ability

Psychometric research has led to the identification of a cognitive ability dimension — divergent thinking — that appears to be different from the ability dimension measured by standardized tests of intelligence.

Ideational fluency, or the ability to generate many ideas, appears to be the most distinct factor to emerge from psychometric research. Further longitudinal research is needed to help us understand the relationship that fluency, flexibility, and originality, as measured by tests administered during childhood, might have to later creative performance. Can very high scores on a battery of creative-divergent thinking alert us to the possible existence of abilities that, with sufficient nurturing, may result in unique, creative performance?

Figure 9
Guidelines for Observing Behavior

1. Teachers, parents, peers, and significant others are in a position to notice student behaviors that occur rather consistently, or that occur with regularity under certain conditions. In general, it is these consistent patterns of behavior that we need to look for as part of the process of identifying children who may have unique ability in creative thinking.

2. Psychological labels are often used to extend the meaning of a pattern of behaviors beyond the actual behaviors observed. A group of behaviors may, for example, be referred to as being representative of "extraversion" or "shyness." Such groupings and labels can lead to ambiguity, confusion, misinterpretation, and miscommunication. One teacher's "self-confident" behavior may seem more like an "egotistical" behavior to another. Appropriate teacher checklists should list only behavioral characteristics that are directly observable, either in isolation or as a cluster.

3. Checklists of behaviors may list characteristics found in highly creative adults or may reflect studies of childhood creativity, relating them to strong divergent-thinking abilities. In adult studies, some may be field- or domain-specific (e.g., characteristics of creative writers); others may be more general. In general, checklists are most useful when they reflect the points of similarity between both types of studies.

4. For identification purposes, it is recommended that checklists of behavior be used by adults and the student himself/herself. Sociometric peer data might be used to suggest children, but should not be used for formal identification. For increased validity, two, but preferably three or more, adult observations are recommended in addition to a self-report if the child is old enough to reflect on his/her own behaviors in a meaningful way. Observation by adults can be made in a variety of contexts, including home, school, private lessons, camps, or enrichment programs. The location is much less important than the potential bias of the rater. If a rater appears to want to unduly influence the process, that checklist should be viewed with extreme caution.

5. The purpose of a checklist is to search for children so that we can support and nurture their abilities. It is not expected that all behaviors will be present in full adult form. Checklists should be modified over time to reflect the latest and best thinking in the field. In addition, each item should reflect related observations from educational and/or clinical practice. When the results are summarized, it is critically important that descriptive phrases be used so that a single word does not lead to misinterpretation.

6. The troublesome issue remains as to whether or not creative behaviors can be taught. While all children have creative-thinking and problem-solving abilities at some level, it does not follow that all have the characteristics cited by Martindale (1989). If teacher training is used as the focus for identification efforts, all children will benefit and those with special creative gifts are more likely to be recognized and served.

Possible Roles for Assessment of Creative-Thinking Ability. The value of assessment to the identification process is that it gives *all* children equal opportunity to demonstrate their abilities with environmental and other factors held as constant as possible. Students may be assessed in groups or individually, but the stimulus questions and comparison pool should remain the same for all students within the population being assessed. Students who perform exceptionally well in comparison with other students their age may be thought of as having *potentially* unique ability in creative thinking.

There are two forms that an assessment of divergent thinking might take: screening (group) and individual assessment. All assessment results should be examined in conjunction with other information about the child's abilities and performance before making a determination that the child has unique ability. Assessment information should be considered suggestive and should never be used in isolation.

Screening. Screening activities should be completed within the classroom. At least once during the elementary or middle grades, it is recommended that all students at a grade level participate in a similar series of screening activities. Screening is designed to locate students with high levels of the types of abilities that have been implicated in the creative process. It may be particularly valuable in helping to locate those students whose ongoing classroom work may not reflect the use of such abilities (and who therefore are not identified through performance-based assessment techniques). Types of screening activities follow:

- **Standardized Tests**
  Commercially available, standardized tests may be used, such as the *Torrance Tests of Creative Thinking.*
- **Research-based Screening**
  Research instruments may be used for screening purposes *if* the results are monitored as part of an ongoing study to determine the potential utility of this form of assessment. Specific subsections of various instruments might be selected to obtain a broad-based, representative series of questions that could be administered quickly and easily within classrooms.
- **Activity-based Assessment**
  Open-ended questions may be designed by teachers or curriculum planners to elicit the types of responses typically sought in creativity testing: fluency of ideas, flexibility, originality, elaboration, and associations. Teachers may then use these questions to structure classroom activities that will help them monitor creative/divergent responses.

Individual Assessment. Any of the strategies described on page 28 might also be used to assess individual children. The choice will depend on the purpose of the assessment and the amount of comparative information (related to other students this age) that is needed. Commercial tests typically provide guidelines or statistics against which the student's performance might be compared.

Assessment Strategies. The decision to use published tests, research instruments, or activity-based assessments will depend on (a) the level of teacher knowledge about, and experience with, creative-thinking and problem-solving strategies; (b) the purpose for which the results will ultimately be used; (c) the other types of information being gathered; and, (d) the funds available (see Figure 10).

Selecting Appropriate Instruments: The Profile Analysis Approach. In general, both published tests and research instruments attempt to assess some or all of the characteristics that are seen by their authors as underlying "creative capability," such as fluency, flexibility, originality, and associative ability. All of these characteristics can be assessed, both verbally and nonverbally, at marginal to acceptable levels of reliability. However, convincing validity data are rarely provided in the manuals for these measures, and the existing validity studies employ a wide variety of definitions of the creativity construct.

Because of the multidimensional nature of this concept, and because other human characteristics, such as personality and motivational attributes that may also contribute substantially to creative performance, it is not possible to select a single test that will successfully measure creativity. Measuring only one of those factors, particularly as a basis for identifying a child as "gifted" in creative-thinking ability, cannot be justified in light of existing research (Clark, Swassing, & Downhower, 1990).

Research results do suggest that there is an individual difference characteristic that might be called "creative capability" which centrally underlies creative performance of different kinds in different modalities. While this construct has been somewhat elusive and resistant to effective measurement, there are substantial reports of factorial validity, or the identification of clusters of variables, that appear in a somewhat general and intuitive way to be measuring "creative capability" (Clark, 1990).

Given the possibility that such a capability might exist, a defensible approach at this time to the use of creative-thinking instruments might be to construct a small battery of tests to assess the factors thought to be related to this capability. A *profile analysis* approach might then be used to identify students whose performance — products, solutions, ideas, — should be examined and monitored more closely. The percentage of students whose work will receive additional attention might range from five to twenty percent, based on the characteristics of the general student population. Over time, data should be collected and analyzed by each district to determine the effectiveness of this approach in locating students with potentially unique ability (see Figure 11).

Figure 10
Activity-based Assessment of Cognitive Processes

Overview

In activity-based assessment of cognitive processes, the teacher provides a group of students with an open-ended question, problem, or activity, and observes their responses as the activity unfolds. This provides a *sample* of the students' creative-thinking abilities and shows the teacher which students, in this short-term activity setting (a) had the most ideas; (b) frequently changed the categories of ideas that might help solve the problem; (c) had original ideas, unique for this age; (d) elaborated on their ideas, adding lots of rich detail; and, (e) developed unique solutions for the problems posed. This information can help the teacher identify students whose responses are so unique that the teacher will want to carefully monitor these students' responses in more extended, real-life situations that call for creative thinking. If the high level of performance is consistent over time, the teacher may wish to refer the child for gifted student identification in the area of creative-thinking ability. These assessment results may be included to support an identification referral.

Directions

1. Select activities appropriate for your grade level. Examples are listed below.
2. Create a group of children who will participate in the activity; typically 5-8 children can be evaluated at the same time.
3. Determine the focus of the evaluation (the types of cognitive processes you hope to elicit with the activities).
4. Conduct the activities and record your findings on the back of this form.

Cognitive Process Implicated in Creative Thinking

Fluency of ideas	How many ideas were generated that were also appropriate, or responsive, to the question?
Flexibility of thought	How many times did the student shift categories or approach the problem from a different direction?
Originality	How novel or unique were the ideas or solutions the student produced?
Elaboration	How much did the student embellish his/her ideas, or add relevant details?

Examples of Group Activities

Verbal/Manipulative — In a problem-solving situation, brainstorm possible solutions, look at the problem in a different way, and use metaphors or analogies to extend ideas. Show students a picture and ask them to generate ideas about what is happening and why, or to create a story about the picture. Ask students to design something using a particular set of materials. Have students tell a story or write a play that shows how a central character solves a problem in a unique way.

Figural — Provide open shapes and ask the students to design something new and different. Provide a series of closed shapes and ask the students to make something interesting with them. Look for *ideas* rather than technical competence/artistic ability.

Figure 10 *(continued)*

Please attach this evaluation form to the assessment if written responses were obtained.

Student Name _____ School Year _____ Grade _____

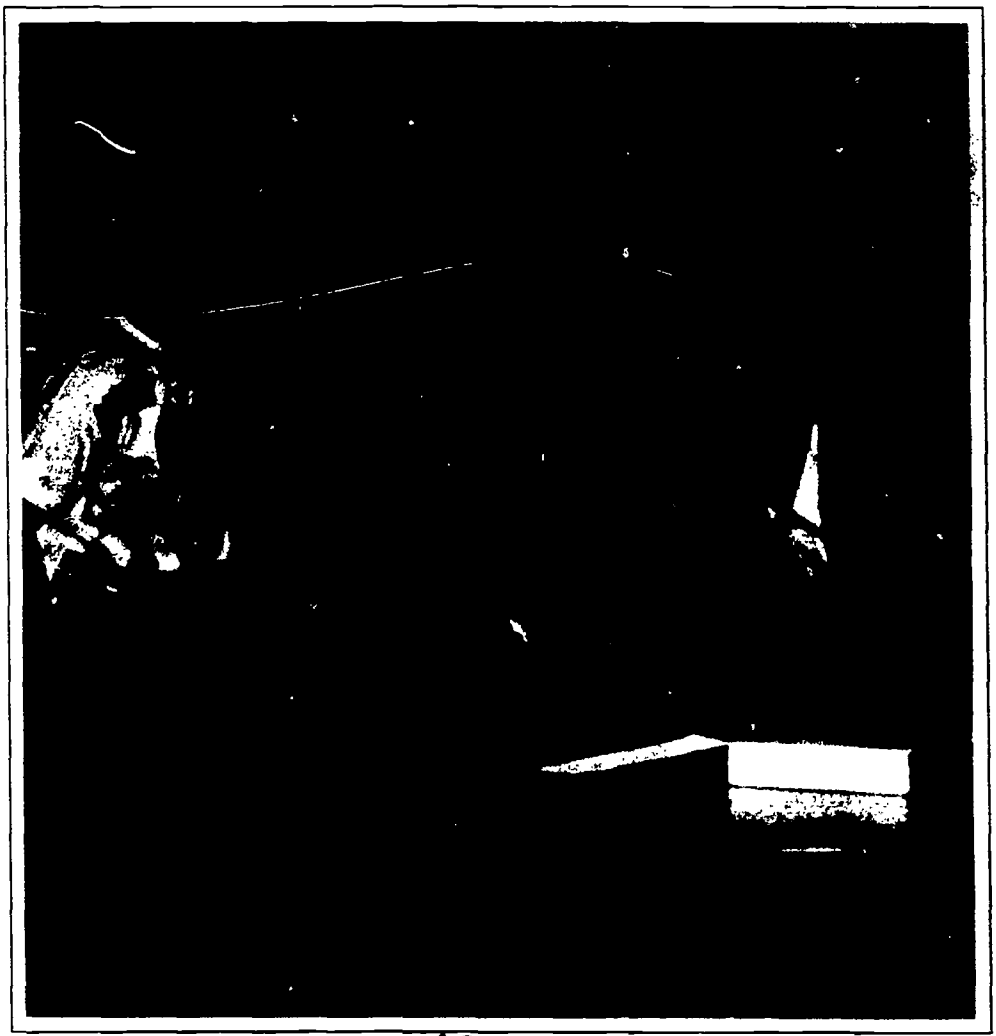
Teacher _____

Number of Students Participating _____

Briefly Describe the Activity

	Teacher Rating		
In comparison with other students this age, this student's response were	**5 Exemplary**	**4 Excellent**	**3 Adequate**
1. Fluency of ideas	exceptional number of ideas	highest number in this group	average number of ideas
2. Flexibility of thought	large number of conceptual shifts	more shifts than others in this group	average number of shifts
3. Originality	startling but appropriate ideas	more unique than ideas of group	some unique ideas
4. Elaboration	exceptional richness of detail	more detail than others in this group	some details

The profile analysis approach would not take the place of direct, ongoing examination of all students' products for evidence of unique ability. Rather, it would serve as a safety net to insure that students who may have unique abilities but are not currently using them would be identified and encouraged to become more productive. As such, the battery would serve as a screening device. It is not recommended that students be identified as "creatively gifted" based on results of this type of assessment.



42

Figure 11
Profile Analysis Form

Profile Analysis Form
(date)

Students	Assessment Results			
	_____ Verbal		_____ Nonverbal	
	Fluency	**Flexibility**	**Originality**	**Association**
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

Part III: The Critical Role of Teacher Development

The identification of creative-thinking ability in school children must start with teachers who have been well prepared to nurture creative thinking and problem solving in the classroom, and who offer many opportunities for their students to demonstrate potentially unique ability through writing, science projects, art, and other activities. Coupled with this performance-based approach to creativity should be assessment, at regular intervals, of the cognitive strategies that researchers believe are most directly associated with creative thinking, such as ideational fluency, flexibility, and originality. This two-pronged approach provides for recognition of creative productivity, while screening for abilities that may not yet be fully expressed.

The role of the teacher is critical in transforming student potential into actuality, and ability into productivity. But the role of the school district in supporting teachers is also critical. Teachers must be helped to create environments that encourage intellectual risk-taking and original thought. Also, they should be given opportunities to learn strategies that they can use with all students to enhance creative thinking and problem solving in the classroom. The greater the knowledge base and facility of teachers in this area, the greater their ability to nurture and recognize potentially unique, creative abilities in their students. This section provides a framework for organizing such training opportunities.

Steps in Implementing a Teacher Development Program

Step 1: Selecting or Developing a Definition of Creative Thinking. As explained earlier, one of the first steps in developing a districtwide identification system is the selection of an operational definition of creative thinking that will guide the identification effort. It was suggested that this definition should reflect the three primary elements associated with creative thinking: person, process, and product. The same step must be accomplished prior to initiating teacher training activities. First, we must be able to define what it is that we hope to prepare teachers to stimulate in their students.

A wide variety of strategies, techniques, and materials are now available to support creative-thinking and problem-solving activities in the classroom. However, without a guiding framework or orientation, these strategies can become one-shot, short-lived classroom activities. The definition of creativity offered in Part I can provide a needed framework or structure for guiding teacher development activities.

Step 2: Designing a Teacher Preparation Process. Designing a teacher preparation process in the area of creative thinking and problem solving is similar to designing teacher preparation in other areas. Decisions must be made about the amount of time to commit, the budget, the amount of release time and/or reimbursement available for teachers, and so forth. Two of the basic "truths" of teacher training apply

- Good teacher preparation takes time
- "Learn - try - apply," or learning by doing, is the method most likely to obtain the desired results

Teacher development can occur through the traditional route of direct instruction and application activities with a group of teachers, or it can take a more nontraditional route, such as weekly one-page training bulletins. Most of us develop teacher training programs with very limited resources, staff, and materials. In this case, the project provided the means to explore possibilities and help define what an appropriate teacher training program in this area might look like.

Figure 12 provides recommendations for the sequence of topics that could be included in a teacher preparation program, depending on the total amount of time allocated to staff development activities (Dungan & Morrison, 1991). Project staff suggests that six hours of staff development would provide all of the basic information needed to encourage creative thinking and problem solving in the classroom. If staff development is limited to six hours, training activities should be completed in a minimum of two sessions staggered over time to allow for classroom application.

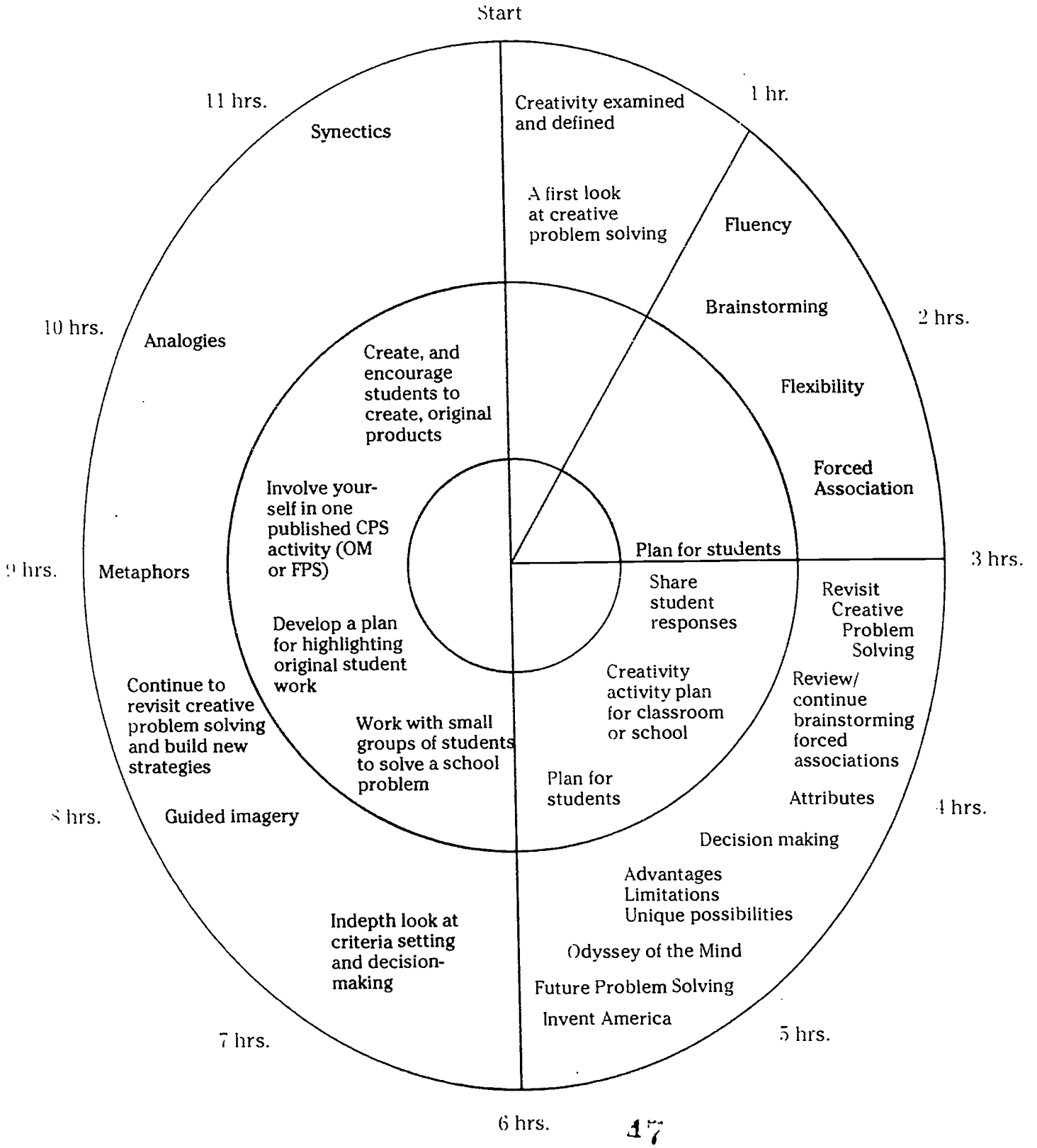
A Sample Training Program

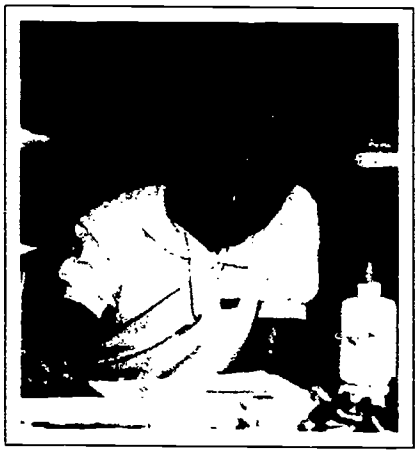
One of the project objectives was to field test a staff development program designed to (a) help teachers become more adept at spotting and referring children with creative-thinking potential, and (b) increase teacher confidence in incorporating creative thinking and problem solving in the classroom.

To achieve this objective, project directors conducted inservice for elementary and some middle school teachers during each year of the project. About 50 teachers attended each year, equally distributed between the two districts. Throughout this training, the creative problem-solving process (CPS) was used as a framework for organizing the wide variety of strategies that are now available for enhancing creative thinking.

The Training Sequence. The teacher development provided through this project was designed to (a) develop knowledge and skills during the training sessions, and (b) provide opportunities for teachers to apply this knowledge in the classroom, report the results, ask questions, and refine their skills before moving on to the next topic. Teachers were compensated for attending two evening training sessions (4:00-7:00 p.m.) and were given one day of release time to participate in a full-day training session. Thus, the program provided 12 hours of training to teachers. Evaluations documented that teachers felt the amount of time available and the use of time during training were positively related to the success they had in applying the new skills in their classrooms.

Figure 12
Designing a Teacher Development Program





The Training Process. Training activities were organized to create a foundation of understanding upon which strategies could be learned and applied in the classroom. Problem-solving was emphasized as the framework for generating more and better ideas and teachers were introduced to the six steps of problem solving (see Figure 13). Direct instruction, coupled with opportunities for small-group interaction and application, formed the basis for teacher development.

After the first session, all sessions began with a period of required reporting-out, during which teachers shared their experiences in applying the strategies to the classroom and gave examples of students' work. Following the sharing, the trainers reviewed the strategies taught in the previous session, answered questions, and offered additional hints for using the strategies successfully in the classroom.

The large group was then divided into three smaller groups that rotated to learn new strategies. Each group leader introduced and explained a new strategy, provided several examples, then engaged the group in two to three problem situations. For most strategies, teachers were given 14" x 18" posters that listed key steps and could be posted in the classroom for reference during instructional activities. The strategies selected for use in training were those that were easily transferred to the classroom and had widespread applicability to problem-solving situations.

Each session incorporated previously-taught strategies to encourage familiarity and mastery of their use. Also, all training sessions continued to engage participants in the problem-solving process with an emphasis on idea finding and, to a lesser extent, solution finding (decision making).

Group instructional leaders were drawn from the gifted education staffs of the two participating districts. Teachers were selected because they were known to have used a particular strategy effectively with their students.

At the end of each period teachers were given time to plan ways of using the new strategies with their students. Materials were also available for teachers to review and use. The classroom application component of each training session was regarded as a critical element of the training program.

Using Special Programs to Encourage Problem Solving. During the training, special programs were reviewed and discussed that either already included, or could include, creative-thinking and problem-solving components. Thus, Future Problem Solving and Odyssey of the Mind, both of which are based on a problem-solving process, were presented. History Day, Science Fairs, and Invent America programs were reviewed because they could result in original or unique products. Such programs allow teachers to incorporate the problem-solving process into their classrooms, using materials that are already prepared and available, or using programs that may already be part of the curriculum.

Figure 13
Steps in Problem Solving

THE STEPS	WHAT HAPPENS
A Problem Exists	Identify the problem by asking questions: Who, What, Where, When, Why? We need to enhance student ability to recognize or sense problems.
Data Finding (Clarify the Problem by Collecting Information)	We need to collect data in order to improve the understanding of the problem. What is "fuzzy" needs to be made clear. Ask: What are illustrations of the problem? What are things that cause the problem? What are further problems caused by the problem?
Problem Finding (Stating the Problem)	Many problems may be imbedded in the original problem. State subproblems, recognize problems *caused* by the problem. A manageable problem is selected and stated in the form of: "In what ways might ...?"
Idea Finding (Generating Solutions)	Generate as many ideas as possible for solving the problem. This is a good place to use creative thinking techniques. Brainstorm ideas.
Select a Solution (Decision Making)	Choose the most important criteria; use the decision-making process and evaluate potential solutions against defined criteria. Ask, what criteria must the solution meet? What solution comes out on top?
Acceptance Finding (Implementing the Solution)	Work out the details: Who will do what? How? Where? What should we watch for? How can we convince others? Who else must be involved? Identify "assistors" and "resistors."

Project Results

Staff Participation. Approximately 100 elementary and middle school teachers from the Hilliard and Upper Arlington school districts participated in one of two staff development sequences based on the concept of creative problem solving and associated strategies (Project Vanguard).

Benefits to Students. Approximately 2,500 regular class children will benefit annually from the staff development component of this project. It can be assumed that between 100 to 300 of each group are gifted children.

The specificity of the identification process outlined in this project has potential implications for all children in Ohio who are gifted in the area of creative thinking. Recommendations will impact future changes in the state *Rule* and will enhance the current identification process for this group of children.

Project Product

A 129-page manual, *The Identification of Creative-Thinking Ability: A Multifactored Approach* provides additional information about current research and the proposed identification system. A copy of this manual can be obtained by contacting Dr. Rebecca Dungan.

Epilogue

This publication has outlined a comprehensive approach to identifying and teaching the creative-thinking process in the schools. The major issues are summarized below.

Creativity can be viewed from many theoretical viewpoints. To implement a program, one viewpoint must be adopted as the underlying rationale for the process and program that follows.

Creativity continues to be one of the most pervasive and elusive concepts in gifted education. No one program can accommodate all viewpoints adequately. Recognition of and adherence to one theoretical position appears to be the best approach at this time.

Priorities may vary from district to district. Such issues as the state of the overall identification process for gifted, the reform or restructuring of the general curriculum, and the commitment of the staff to teach creativity and creative problem solving are elements that must be considered.

Schools are faced with many challenges and limited resources. The system outlined in this publication envisions an ideal but acknowledges what is real. The project staff suggests implementation to the degree that is possible within the context of the individual system.

The actual identification process should involve the three steps of establishing a rationale for identification, selecting an operational definition of creativity, and designing a district plan to guide identification efforts.

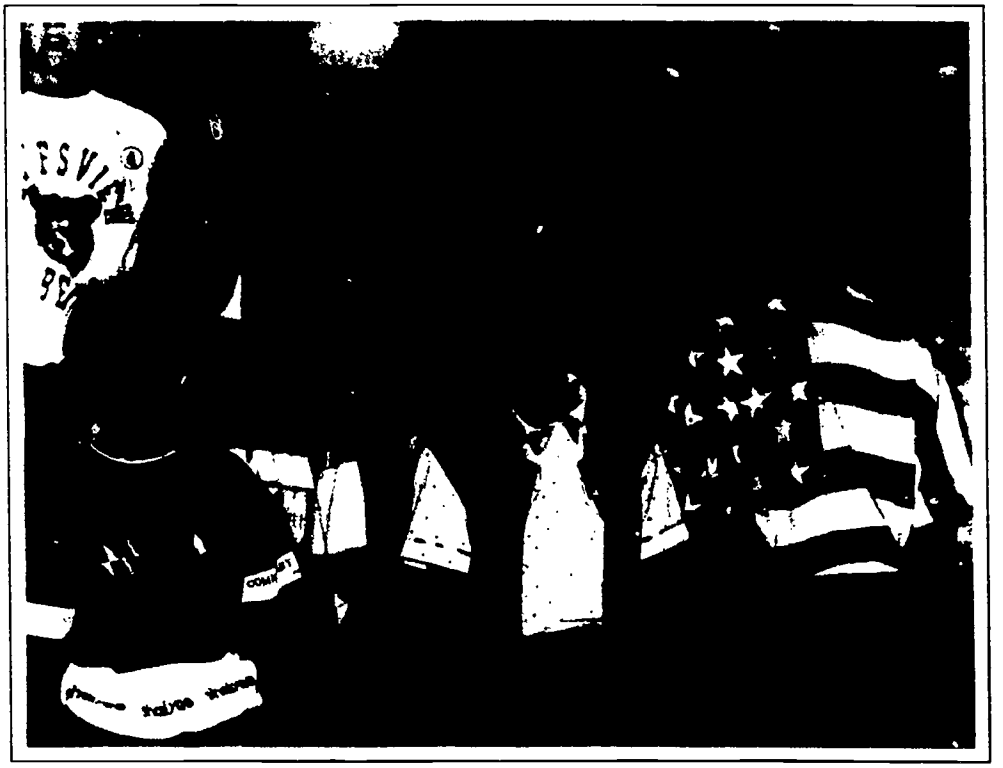
The project staff strongly believes that planning an identification program should be based on a rationale and definition of creativity appropriate for the district. Without these guidelines, it is likely that an indefensible hodgepodge of identification procedures will result.

Successful implementation of the identification process is, in large part, dependent upon the ability of teaching staff to recognize and teach the creative-thinking process.

The classroom teacher stands at the first door to identification of all gifted children. Since teachers' knowledge of creativity is likely to be less well-developed than in the areas of cognitive or academic giftedness, staff development is a necessary and important part of the proposed process.

The actual identification process should consist of three components: performance-based assessment, observation of behavioral characteristics, and creativity testing. The importance of each component will rely heavily upon the sophistication of the staff in identifying creative thinking in gifted children and in providing activities that will elicit creative behavior and/or products for performance-based assessment and behavioral observation.

In the young child and maturing student, the adult behaviors associated with creativity and creative-thinking ability are likely to be manifested in immature forms. To serve the potentially creative child and to assist in the development of creativity in the largest possible group, a broad spectrum of identification data must be gathered. This publication has outlined ways to gather such data using three research-based and acceptable formats, and has acknowledged the importance of staff development prior to implementing the performance-based and observational components of the system.



References

Amabile, T. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology, 45,* 357-376.

Brandt, R.S. (1988). *Content of the curriculum (1988 ASCD Yearbook).* Alexandria, VA: Association for Supervision and Curriculum Development.

Brown, R.T. (1989). Creativity: What are we to measure? In J. Glover, R. Ronning, & C. Reynolds (Eds.), *Handbook of creativity.* New York: Plenum Press.

Buzzard, V., Hinton, H., & Hoover, B. (1990). Personal communication.

Clark, B. (1986). *Growing up gifted (2nd ed.).* Columbus, OH: Merrill Publishing Co.

Clark, P.M. (1990). Personal communication.

Clark, P.M., Griffing, P.S., & Johnson, L.G. (1989). Symbolic play and ideational fluency as aspects of the evolving divergent cognitive style in young children. *Early Child Development and Care, 51,* 77-88.

Clark, P.M., Swassing R., & Downhower, S. (1990). Personal communication.

Costa, A. (1985). *Developing minds: A resource book for teaching thinking.* Alexandria, VA: Association for Supervision and Curriculum Development.

Dungan, R., & Morrison, M. (1991). *Project Vanguard: Staff development handbook.* Columbus, OH: Hilliard City School District and Upper Arlington City School District.

Feldhusen, J.F., & Treffinger, D.J. (1985). *Creative thinking and problem solving in gifted education (3rd ed.).* Dubuque, IA: Kendall/Hunt Publishing Company.

Gardner, H. (1988). Creative lives and creative works: A synthetic scientific approach. In R.J. Sternberg (Ed.), *The nature of creativity: Contemporary psychological perspectives.* New York: Cambridge University Press.

Guilford, J.P. (1950). Creativity. *American Psychologist, 5,* 444-454.

Guilford, J.P. (1956). The structure of intellect. *Psychological Bulletin, 53,* 267-293.

Guilford, J.P. (1959). Three faces of intellect. *American Psychologist, 14,* 469-479.

Guilford, J.P., & Hoepfner, R. (1971). *The analysis of intelligence.* New York: McGraw-Hill.

Harrington, D.M., Block, J.H., & Block, J. (1983). Predicting creativity in preadolescence from divergent thinking in early childhood. *Journal of Personality and Social Psychology, 45,* 609-623.

Hennessey, B., & Amabile, T. (1988). The conditions of creativity. In R.J. Sternberg (Ed.), *The nature of creativity: Contemporary psychological perspectives.* New York: Cambridge University Press.

Hinton, N. (1990). Personal communication.

Isaksen, Scott, & Treffinger, D.J. (1985). *Creative problem solving: The basic course.* Buffalo: Creative Education Foundation.

Kogan, N. (1983). Stylistic variation in childhood and adolescence: Creativity, metaphor, and cognitive style. In P.H. Mussen (Ed.), *Handbook of child psychology (Vol. III) (4th ed.).* New York: John Wiley and Sons.

MacKinnon, D.W. (1970). Creativity: A multi-faceted phenomenon. In J.D. Roslansky, (Editor) *Creativity.* Amsterdam/London: North Holland Publishing Co.

Martindale, D. (1989). Personality, situation and creativity. In J. Glover, R. Ronning, & C. Reynolds (Eds.), *Handbook of creativity.* New York: Plenum

Marzano, R., Brandt, R., Hughes, C., Jones B. F., Presseisen, B., Rankin, S., & Suhor, C. (1988). *Dimensions of thinking: A framework for curriculum and instruction.* Alexandria, VA: Association for Supervision and Curriculum Development.

Mednick, S. (1962). The associative basis of the creative process. *Psychological Review, 69,* 220-227.

Mednick, S., & Mednick M. (1967). *The Remote Associates Test (RAT).* Boston: Houghton Mifflin.

Meeker, M., & Meeker, R. (1988). *SOI Learning Abilities Test.* Vida, OR: SOI Division of M&M Systems.

Osborn, A. (1963). *Applied imagination: Principles and procedures of creative problem solving (3rd ed).* New York: Charles Scribner's Sons.

Ohio Department of Education. (1984). *Rule for school foundation units for gifted children.* Columbus: Author.

Parnes, S. (1972). *Creativity: Unlocking human potential.* Buffalo, New York: D.O.K. Publishers.

Perkins, D.N. (1984). Creativity by design. *Educational Leadership, 42,* 18-25.

Piirto, J. (1992). *Understanding those who create.* Dayton, OH: Ohio Psychology Press.

Raudsepp, E. (1980). *Creative growth games.* New York: G.P. Putnam and Sons.

Sternberg, R.J. (Ed.). (1988). *The nature of creativity: Contemporary psychological perspectives.* New York: Cambridge University Press.

Sternberg, R.J. (1991). An investment theory of creativity and its development. *Human Development, 34,* 1-31.

Torrance, E.P. (1966). *The Torrance Tests of Creative Thinking: Norms-technical manual research edition.* Lexington, MA: Personnel Press/Ginn.

Torrance, E.P. (1974). *The Torrance Tests of Creative Thinking: Norms-technical manual.* Lexington, MA: Personnel Press/Ginn.

Torrance, E.P. (1974). *Future Problem Solving Program*. Cedar Rapids, IA: Coe College.

Torrance, E.P. (1979). *The search for satori and creativity*. Buffalo: Creative Education Foundation.

Torrance, E.P. (1988). The nature of creativity as manifest in its testing. In R.J. Sternberg (Ed.), *The nature of creativity: Contemporary psychological perspectives*. New York: Cambridge University Press.

Treffinger, D.J. (1989). *The prospector's lantern, 1*, 2-3.

Van Oech, R. (1983). *A whack on the side of the head: How to unlock your mind for innovation*. New York: Warner Brooks, Inc.

Weisberg, R.W. (1988). Problem solving and creativity. In R.J. Sternberg (Ed.), *The nature of creativity: Contemporary psychological perspectives*. New York: Cambridge University Press.

Appendix A

Committee Members

The Identification of Creative-Thinking Ability: A Multifactored Approach was developed through a gifted education research and demonstration project funded by the Ohio Department of Education (1989-1991). Members of the committees listed below made significant contributions to the design of this approach, and their willing cooperation, expertise, and breadth of perspective are gratefully acknowledged.

Dr. Rebecca Dungan, coordinator, programs for the gifted,
Hilliard City School District

Dr. Margaret Morrison, director, gifted education services,
Upper Arlington City School District

Project Advisory Team

Hilliard City Schools

Donna Swenson, president, Board of Education

Roger Nehls, superintendent

Nancy Tussing, director of pupil services

Diane Hammonds, principal

Upper Arlington City Schools

Jean Thompson, president, Board of Education

Dr. Homer Mincy, superintendent

Dr. John Sonedecker, assistant superintendent

Dr. Ted Oakley, principal

Technical advisor: Dr. Jane Piirto, associate professor, Ashland University

Behavioral Observations Review Team

Dr. James DeLisle, associate professor, Department of Special Education,
Kent State University

Jeanne Hilson, supervisor (retired), Gifted and Talented Program,
Columbus City Schools

Pat Holcomb, supervisor, Able and Talented Program,
Westerville City Schools

M. Tracy Jageman, coordinator of talented and gifted,
Southeast Ohio Special Education Regional Resource Center, Athens

Test Review Team

Dr. Philip M. Clark, professor, Department of Psychology,
The Ohio State University

Dr. Susan Downhower, school psychologist, Reynoldsburg City Schools

Dr. Raymond H. Swassing, associate professor,
Department of Educational Services and Research, The Ohio State University

Performance-based Assessment Review Team

Virginia Buzzard, talented and gifted corrdinator, Marietta City Schools

Dr. Nadine K. Hinton, senior research associate,
Biomedical Engineering Center, The Ohio State University;
and educational consultant, Ohio Academy of Science

Barbara Hoover, gifted education teacher, Hilliard City Schools

57

Appendix B

Using Special Programs and Competitions to Assess Creativity

Science Fairs

As defined in scoring protocols for the Ohio Academy of Science (OAS) and the National Science Teachers Association (NSTA), the key facets related to creativity are problem/approach uniqueness, new approaches to old subjects, new presentations, and student initiative. Scoring is done on a 40-point system with originality/creativity, knowledge achieved, use of the scientific method, and clarity of expression each receiving a maximum of 10 points.

Once students have progressed to state level or beyond (having received superior rating at the district level), originality/creativity provides 25% of the total score. It is also possible that part of the scores assigned for knowledge achieved and/or use of the scientific method might reflect unusual approaches to the research problem. Therefore, for students who progress to the level of state or international competition, information on scores on science fair projects should be examined as an additional source of information for the identification of unique levels of creative-thinking ability (Hinton, 1990).

History Day

History Day competitions involve production of group or individual projects. Depending on local support, the program may operate K-12; typically, it is a secondary-level activity. Each year's competition has a broad theme and part of the student's score reflects how well the project, which may range from an historical paper to a performance to a media production, reflects that theme. Scoring criteria include historical quality (60%), quality of presentation (20%), and adherence to theme (20%).

Under *quality of presentation*, creativity-related criteria include originality/creative/innovative in subject and implementation; the literary style of written products; stage presence in performances; and clear, attractive presentation of visual materials.

Under *adherence to theme*, related criteria include topical focus, placement in an historical context, the student's analysis and understanding of the historical significance of the topic, and the handling of the theme in a unique way beyond mere description.

These projects, especially for students who have progressed to state-, and national-level competitions, should be examined for evidence of potential unique ability in creative thinking (Hinton, 1990).

Student Inventions

Inventive talent may be encouraged by involvement in programs such as Invent America and through the use of materials such as *Using Creative Problem Solving in Inventing* (Treffinger, McEwen, & Wittig, 1989). The latter materials illustrate how each of the six stages of creative problem solving can be helpful in the inventing process. For information about Invent America, contact the United States Patent Model Foundation, Inc., 510 King St., Suite 420, Alexandria, VA 22314.

A particularly valuable resource for use in evaluating student inventions is the Student Invention Rating Scale developed by Donald J. Treffinger. The scale includes a number of criteria, with descriptions, by which inventions might be evaluated (e.g., original, germinal, transformational, valuable, expressive, and organic). Contact the Center for Creative Learning, 4152 Independence Court, Suite C-7, Sarasota, FL 34234; 813-351-8862.

Holistic Writing Assessment

Holistic writing assessment might provide an excellent opportunity to screen for creative-thinking ability. Depending on the scoring rubric that has been selected or developed by a school district, the highest score(s) may already reflect original or novel approaches.

In order to have sufficient information for identification purposes, school districts might consider using high holistic writing scores as a screening tool, followed by a more extensive examination of student writing *over time*, using the following descriptions:

- Demonstrates exceptional sensitivity to the power and beauty of language
- Chooses to interpret his/her world through the written medium as an essayist, critic, novelist, humorist, researcher or observer
- Voice and style are consistent and distinctive
- Attempts to reach a wider audience whether selective or general
- Is able to "break the rules" as he/she prepares a written message for the audience
- May view writing as something which he/she is compelled to do
- Writes often
- Is able to design his/her own assignments, with the teacher's role becoming that of a facilitator

Odyssey of the Mind

Odyssey of the Mind (OM) is a nationwide competition for students in grades 3-12. Students use the creative problem-solving process as they work in teams of five to seven children. Two kinds of problems are presented: long-term problems that teams work through during the fall and winter, and spontaneous problems that teams must solve during the actual competition. Students are trained in use of the creative problem-solving process, which includes techniques such as brainstorming.

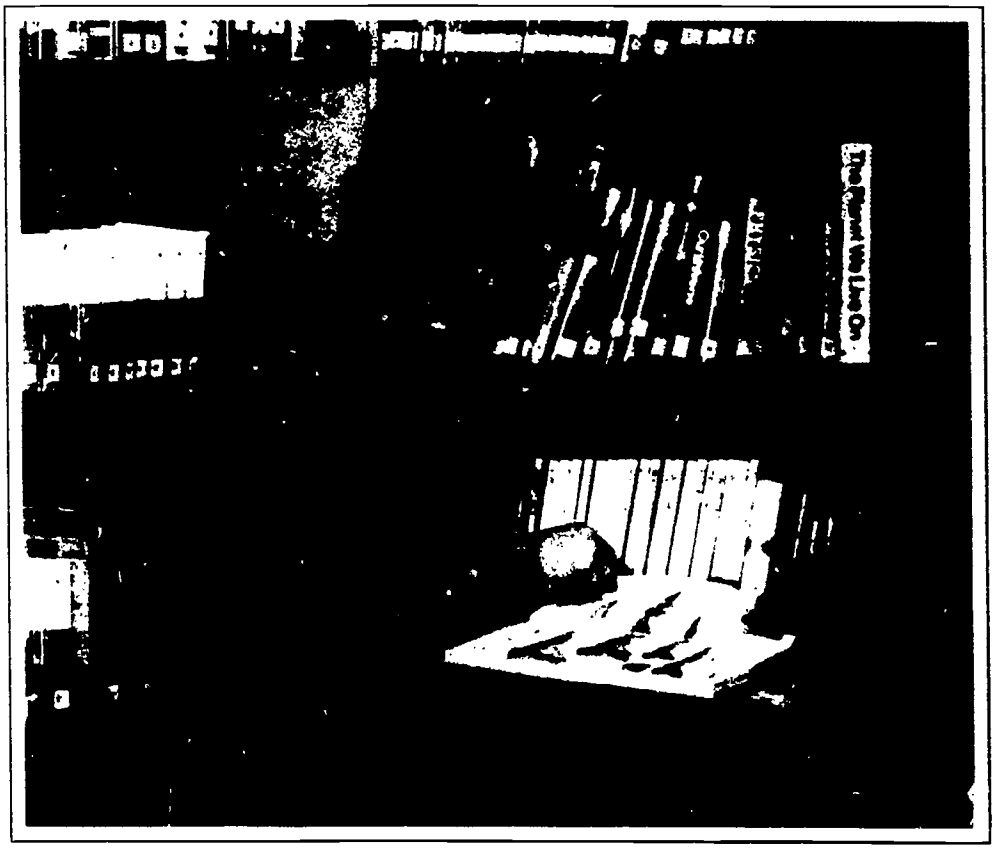
Coaches, parent, and students themselves can observe the responses to OM activities and can use those responses and related scores as a basis for referral for identification (Buzzard, Hinton, & Hoover, 1990).

Future Problem Solving

The Future Problem Solving (FPS) program is an international program that helps youngsters think creatively about ways to solve predicted problems of the future. The program helps students become acquainted with future studies, develop abilities to deal with the unknowns of the future, develop creative and higher-level thinking skills, develop and improve research skills, and improve analytical and critical-thinking skills.

Under the guidance of teacher/coaches, teams of four students in grades 4-12 use a six-step problem solving process to try to solve complex societal problems. Three practice problems are completed by teams and sent to evaluators throughout the school year. The evaluators score the work and return it with suggestions for improvement. The top scoring teams on the third practice problem are invited to the state FPS Bowl in the spring.

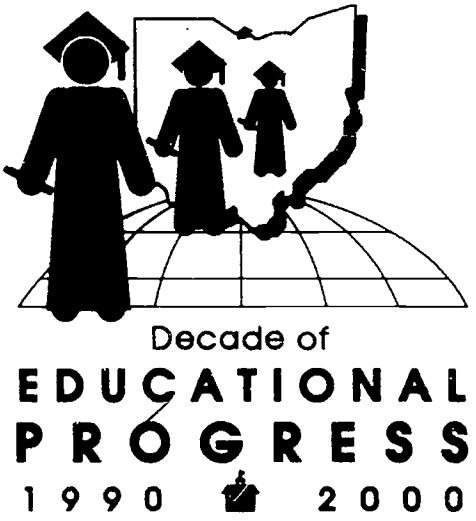
As with the OM competition, coaches and students themselves can observe responses to FPS activities and can use those responses and related scores and feedback as a basis for referral for identification (Buzzard, Hinton, & Hoover, 1990).



Copies available from

OHIO DEPARTMENT OF EDUCATION
DIVISION OF SPECIAL EDUCATION

933 High Street
Worthington, OH 43085-4087



The activity that is the subject of this report was supported in whole or in part by the U.S. Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.